

### **REMARKS**

An Excess Claim Fee Payment Letter is submitted herewith for four (4) excess total claims.

Claims 1-25 are all the claims presently pending in the application. Claims 22-25 have been added to claim additional features of the invention.

Applicant gratefully acknowledges that claims 3-5, 11-13 and 20 would be allowable if rewritten in independent form. However, Applicant respectfully submits that all of the claims are allowable.

Claims 1, 2 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Otani et al. (U.S. Patent No. 6,115,156) in view of Bergano (U.S. Patent No. 6,137,604). Claims 6, 7, 9-10, 14-19 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Otani et al., in view of Bergano and further in view of Prior Art Figure 1.

These rejections are respectfully traversed in view of the following discussion.

#### **I. THE CLAIMED INVENTION**

The claimed invention, as recited in the exemplary embodiment of claim 1 (and similarly recited in claim 9), is directed to a light branching apparatus, including an optical splitter which splits an optical signal for a plurality of channels on a first optical fiber into at least a first optical channel signal on a first channel of a second optical fiber and a plurality of second optical channel signals on a plurality of second channels of a third optical fiber, and a first wavelength dispersion compensator on the second optical fiber which is provided for the first channel and compensates wavelength dispersion of the first optical channel signal due to the optical splitter.

Another aspect of the claimed invention (e.g., as recited in claim 17) is directed to a light branching apparatus which includes an optical switch which switches a transmission channel of a first optical channel signal on a first optical fiber from a first channel on a second optical fiber to a second channel on a third optical fiber, and a wavelength dispersion compensator on the second optical fiber which compensates wavelength dispersion of the first optical channel signal due to the second optical fiber by difference in length between the second optical fiber and the third optical fiber.

Another aspect of the claimed invention (e.g., as recited in claim 18) is directed to a light branching apparatus which includes an optical splitter which splits at least a first optical channel signal from an optical signal for a plurality of channels on a first optical fiber to transmit onto a first channel of a second optical fiber, and a first wavelength dispersion compensator on the second optical fiber which is provided for the first channel and compensates wavelength dispersion of the first optical channel signal due to the second optical fiber.

Conventionally, equalizing fibers are used to “sandwich” a light branching apparatus in order to prevent an imbalance in length (Application at page 7, lines 9-17). However, this resulted in many fibers being needed, and the installation of these equalizing fibers is troublesome and time-consuming.

The claimed invention, on the other hand, includes in one aspect a light branching apparatus having a first wavelength dispersion compensator on the second optical fiber which is provided for the first channel and compensates wavelength dispersion of the first optical channel signal due to the optical splitter (Application at Figures 3-4; page 15, lines 14-24), and in another aspect a wavelength dispersion compensator on the second optical fiber which compensates wavelength dispersion of the first optical channel signal due to the second optical fiber by difference in length between the second optical fiber and the third optical fiber (Application at Figure 10; page 21, line 27-page 22, line 22), and in another aspect includes a first wavelength dispersion compensator on the second optical fiber which is provided for the first channel and compensates wavelength dispersion of the first optical channel signal due to the second optical fiber (Application at page 8, lines 18-23). These features make it easy to install the light branching apparatus in a desired portion of a transmission path.

## **II. THE ALLEGED PRIOR ART REFERENCES**

### **A. The Otani and Bergano References**

The Examiner alleges that Otani would have been combined with Bergano to form the invention of claims 1, 2 and 8. Applicant submits, however, that Otani would not have been combined with Bergano and even if combined, the combination would not teach or suggest

each and every element of the claimed invention.

Otani discloses a demultiplexer having a series of couplers disposed in multi-stages. Each coupler has two branches with one branch of each coupler connected to a separate optical filter and the other branches are series connected to a subsequent stage of the couplers through equalizing fibers (Otani at Abstract).

Bergano discloses a method for managing dispersion in a wavelength division multiplexed (WDM) optical transmission system (Bergano at Abstract).

However, Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, these references are directed to different problems and solutions. Specifically, Otani is intended to provide a demultiplexer which can decrease the number of active devices (Otani at col. 2, lines 8-12), whereas Bergano is intended to provide a system for managing dispersion (Bergano at col. 2, lines 16-27).

Thus, these references are unrelated, and no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight. Indeed, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. In fact, contrary to the Examiner's allegations, neither of these references teach or suggest their combination.

Therefore, Applicant respectfully submits that one of ordinary skill in the art would not have been so motivated to combine the references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither Otani, nor Bergano, nor any combination thereof, teaches or suggests "*a first wavelength dispersion compensator on said second optical fiber which is provided for said first channel and compensates wavelength dispersion of said first optical channel signal due to said optical splitter*", as recited in claim 1.

As noted above, unlike conventional devices, the claimed invention includes in one aspect a light branching apparatus having a first wavelength dispersion compensator on the second optical fiber which is provided for the first channel and compensates wavelength dispersion of the first optical channel signal due to the optical splitter (Application at Figures 3-4; page 15, lines 14-24). This feature makes it easy to install the light branching apparatus in a desired portion of a transmission path.

Clearly, these features are not taught or suggested by the cited references. Indeed, the Examiner attempts to rely on Figure 3 in Otani to support his position. Specifically, the Examiner attempts to equate the equalizing fibers 7-11 in Otani with the first wavelength dispersion compensator in the claimed invention. This is clearly unreasonable.

Indeed, Applicant would point out that the first wavelength dispersion compensator in the claimed invention is formed "on the second optical fiber". In Otani, on the other hand, the equalizing fibers 7 and 8 are formed on optical fiber 17, and the equalizing fibers 9-11 are formed on the optical fiber 18 (Otani at col. 2, lines 57-58).

The Examiner alleges that Otani teaches a "fiber that [is] connected to outputs S3, S4, not shown" (Office Action at page 2). That is, the Examiner alleges that Otani teaches that the signals S3 and S4 would be output from the demultiplexer 19 to a single optical fiber.

However, nowhere does Otani teach or suggest this feature as alleged by the Examiner. Indeed, not only is this feature "not shown" in Otani as conceded by the Examiner, but nowhere is this feature implied or suggested. Moreover, nowhere does the Examiner provide any basis for his assertion but instead, this imaginary "fiber" seems to have been created by the Examiner "out of thin air".

Moreover, the equalizing fibers 7-11 have a completely different function than the first wavelength dispersion compensator of the claimed invention. Indeed, in the claimed invention the first wavelength dispersion compensator compensates wavelength dispersion of the first optical channel signal **due to the optical splitter**. However, nowhere does Otani even mention dispersion due the optical coupler 5 (which the Examiner erroneously attempts to equate with the optical splitter of the claimed invention). Thus, certainly Otani cannot teach or suggest compensating dispersion due to the optical coupler 5. Thus, Otani is completely unrelated to the claimed invention.

Likewise, Bergano does not teach or suggest this novel feature. Indeed, The Examiner does not rely on Bergano as allegedly teaching this novel feature.

Indeed, Bergano states that "[t]he dispersion in each of the plurality of compensating fibers 205<sub>1</sub>, 205<sub>2</sub>, 205<sub>3</sub>, ... 205<sub>N</sub> is selected so that the average chromatic dispersion of the concatenated transmission spans 104 upstream from the dispersion compensator 105 and the equalizing sections 202 and 205 are substantially returned to zero at each of the center

wavelengths  $\lambda_N$ " (Bergano at col. 4, lines 20-26). Thus, nowhere does Bergano teach or suggest that the compensating fibers compensate wavelength dispersion of a first optical channel signal due to an optical splitter.

Therefore, Applicant submits that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention. Therefore, Applicant respectfully request that the Examiner withdraw this rejection.

#### **B. The Prior Art Figure 1**

The Examiner alleges that Otani would have been combined with Bergano and that the alleged Otani/Bergano combination would have been further combined with Prior Art Figure 1, to form the claimed invention of claims 6, 7, 9-10, 14-19 and 21. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Prior Art Figure 1 illustrates a conventional optical communication system having a light branching apparatus 13. Equalizing fibers 18, 19, 21, 22 are inserted to compensate for distances in the optical paths.

However, Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, these references are directed to different problems and solutions.

Further, these references are completely unrelated, and no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight. Indeed, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. In fact, contrary to the Examiner's allegations, neither of these references teach or suggest their combination.

Therefore, Applicant respectfully submits that one of ordinary skill in the art would not have been so motivated to combine the references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither Otani, nor Bergano, nor the Prior Art Figure 1, nor any combination

thereof, teaches or suggests "*a first wavelength dispersion compensator on said second optical fiber which is provided for said first channel and compensates wavelength dispersion of said first optical channel signal **due to said optical splitter***", as recited in claim 1 and similarly recited in claim 9, nor "*a wavelength dispersion compensator on said second optical fiber which compensates wavelength dispersion of said first optical channel signal due to said second optical fiber by **difference in length between said second optical fiber and said third optical fiber***", as recited in claim 17, nor "*a first wavelength dispersion compensator on said second optical fiber which is provided for said first channel and compensates wavelength dispersion of said first optical channel signal **due to said second optical fiber***", as recited in claim 18.

Clearly, these features are not taught or suggested by the cited references. Indeed, with respect to claim 1, clearly the alleged prior art Figure 1 does not teach or suggest. In fact, nowhere does Figure 1 teach or suggest an optical splitter in a branching apparatus. Certainly, Figure 1 does not teach or suggest a first wavelength dispersion compensator on a second optical fiber which is provided for a first channel and compensates wavelength dispersion of a first optical channel signal **due to the optical splitter**.

Further, with respect to claim 18, Applicant would point out that nowhere does the Examiner even address this limitation in the Office Action. In fact, Applicant would point out that this limitation is similar to the limitation of claim 3 which has been allowed by the Examiner.

With respect to the limitation of claim 17, nowhere do the references teach or suggest a wavelength dispersion compensator **on said second optical fiber** which compensates wavelength dispersion of the first optical channel signal due to the second optical fiber **by difference in length between said second optical fiber and said third optical fiber**. In fact, nowhere does the Examiner identify where this feature is taught or suggested by the references.

The Examiner may imply that Otani or Bergano teach this feature. However, this is not correct. Indeed, as noted above, the Examiner attempted to equate equalizing fibers 7-11 in Otani with the first wavelength dispersion compensator of the claimed invention. However, clearly, the equalizing fibers 7-11 in Otani cannot be equated with the first

wavelength dispersion compensator in this embodiment. Indeed, nowhere does Otani teach or suggest that the equalizing fibers 7-11 compensate wavelength dispersion by **difference in length between said second optical fiber and said third optical fiber**. Thus, the Examiner's position is clearly unreasonable.

Therefore, Applicant submits that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention. Therefore, Applicant respectfully request that the Examiner withdraw this rejection.

### III. FORMAL MATTERS AND CONCLUSION

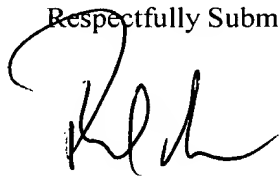
In view of the foregoing, Applicant submits that claims 1-25, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

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Respectfully Submitted,



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